

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Hiroshi Naito et al.

Application No.: 10/584,666

Group Art Unit: 2862

Filed: May 29, 2007

Examiner: B. L. Ledyne

For: MAGNETIC SENSOR AND
MANUFACTURING METHOD THEREFOR

INFORMATION DISCLOSURE STATEMENT (IDS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 CFR 1.56, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

Timing of Filing of the Information Disclosure Statement:

- ☐ This IDS is being filed before the First Office Action¹.
- ☒ This IDS is being filed after the issuance of the First Office Action but before the issuance of a Final Office Action².
- ☐ This IDS is being filed after the issuance of a Final Office Action but before the

¹ The IDS should, where possible, include a certification under 37 CFR § 1.97(c).

² The IDS *must* include *either* a certification under 37 CFR § 1.97(e) *or* the fee set forth in 37 CFR § 1.17(p).

payment of the Final Fee³.

Certifications:

If checked, the undersigned makes the following statement(s):

☒

Statement under 37 CFR 1.97(c):

Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this information disclosure statement; and/or

No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this information disclosure statement was known to any individual designated in 1.56(c) more than three months prior to the filing of the information disclosure statement.

☐

Statement under 37 CFR 1.704(d):

Each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in 1.56(c) more than thirty days prior to the filing of this information disclosure statement.

Fee Required by 37 CFR 1.97(c)(2) or 1.97(d)(2):

☐

If checked, the fee of \$180.00 set forth in 37 CFR 1.17(p) is attached.

³ The IDS must include both a certification under 37 C.F.R. §1.97(c) and the fee set forth in 37 C.F.R. §1.17(p).

Copies of Information:

In accordance with 37 C.F.R. §1.98(a), the following are enclosed:

- ☒ A legible copy⁴ of each document (or relevant portion thereof) cited in the attached PTO/SB/08, except for U.S. patent and U.S. published applications.
- ☒ With respect to any information which is not in English, a concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, is attached. This concise explanation is provided by way of:
- ☐ A translation of the relevant portions of the non-English language information⁵;
- ☐ A statement explaining the relevant portions of the non-English language information;
- ☒ A copy [and, where not in the English language, a translation] of at least the relevant portion(s)⁶ of the communication from a foreign patent office in counterpart foreign application (copy of Japanese Office Action dated January 11, 2011) (and English translation of the relevant portion)) which the information was cited; or
- ☐ This information is contained in the specification of the present application.

⁴ A legible copy of the document is not required if (1) the information was previously cited by, or submitted to, the Office and considered by the Office in a prior U.S. application to which this application claims priority, provided that the prior application is properly identified in this IDS, and (2) the IDS submitted in the earlier application complies with 37 C.F.R. § 1.98(a) – (c). This exception does not apply to information cited in an International Application.

⁵ 37 C.F.R. §1.98(a)(3)(ii) *requires* that an English language translation be provided when a translation of the document, or portion thereof, “is within the possession, custody or control of, or is readily available to any individual designated in 37 C.F.R. § 1.56(c).”

⁶ The relevant portion is that portion which indicates the degree of relevance found by the foreign patent office. This may be an explanation of which portion of the of the reference is particularly relevant, to which claims it applies, or merely an “X”, “Y”, or “A” indication on a search report. MPEP §609 III A(3).

☐ In accordance with 37 C.F.R. 1.98(d), copies of the cited documents are not enclosed as they were provided in application , which the present application relies upon for an earlier effective filing date under 35 U.S.C. 120.

Materiality:

While the information and references disclosed in this Information Disclosure Statement may be “material” pursuant to 37 CFR 1.56, this submission is not intended to constitute an admission that any patent, publication or other information referred to therein is “prior art” for this invention unless specifically designated as such.

In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed references.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 50-2215, under Order No. X2007.0217.

Dated: April 8, 2011

Respectfully submitted,

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拒絶理由通知書

特許出願の番号	特願2005-077011
起案日	平成22年12月28日
特許庁審査官	三浦 尊裕 3775 4M00
特許出願人代理人	志賀 正武 (外 1名) 様
適用条文	第29条第2項、第36条

この出願は、次の理由によって拒絶をすべきものです。これについて意見がありましたら、この通知書の発送の日から60日以内に意見書を提出してください。

理 由

I. この出願の下記の請求項に係る発明は、その出願前に日本国内又は外国において、頒布された下記刊行物に記載された発明又は電気通信回線を通じて公衆に利用可能となった発明に基いて、その出願前にその発明の属する技術の分野における通常の知識を有する者が容易に発明をすることができたものであるから、特許法第29条第2項の規定により特許を受けることができない。

記 (引用文献等については引用文献等一覧参照)

- ・請求項 1, 2, 4, 5
- ・引用文献等 1, 2
- ・備考

引用文献1の全文、全図、特に、発明の実施の形態欄における第2の実施形態に係る段落【0034】～【0051】、図8等を参照されたい。

引用文献1は、Z軸磁気抵抗効果素子24を楔型溝25aの斜面に配置している点で、“突起部の斜面”に巨大磁気抵抗素子を設ける本願発明と構造が相違している。

しかしながら、下記引用文献2、特に、実施例欄、図1等に記載がなされているように、基板上にSiO₂などの酸化膜により形成した傾斜台上に磁気抵抗効果素子を形成する構造は周知の技術である。よって、上記相違点は当業者であれば容易に想到し得た事項である。

また、感磁部のピンニング方向を、感磁部の長手方向に対して30～60度とすることも周知の技術である（下記引用文献2の第2頁左下欄第11行～13行等を参照されたい。）

以上より、本願発明は、引用文献1に対し、引用文献2に開示された周知の構成を適用することで、当業者であれば容易に想到し得た発明である。

- ・請求項 6
- ・引用文献等 1－4
- ・備考

上記引用文献1、及び、引用文献2の引用箇所等を参照されたい。“直線状の稜線”を形成するエッチング工程として、フォトリソ膜に加熱処理を行い、レジスト膜の側面を傾斜面とした上で、被エッチング部材を斜めにエッチングする技術は、当該技術分野における公知の技術であり（例えば、下記引用文献3（段落【0049】－【0051】等参照。）、当業者であれば容易に採用することができたものである。

また、巨大磁気抵抗膜を成膜したのち、基板をマグネットアレー上に置いて熱処理を施し、ついで、巨大磁気抵抗効果素子を形成するプロセスは、周知のプロセスである。（例えば、下記引用文献4の【0028】－【0033】、図3等参照のこと。）

以上より、本願請求項6に記載された磁気センサの製法も、当業者であれば、下記引用文献1－4等により容易に想到し得たものである。

II. この出願は、特許請求の範囲の記載が下記の点で、特許法第36条第6項第2号に規定する要件を満たしていない。

記

請求項1、6、7の記載は、範囲をあいまいにする表現（「略直線」，「ほぼ1：1」）を有しているため、発明の範囲の外延が不明確である。

よって、請求項請求項1、6、7、及び、前記請求項1に従属する請求項2－5に係る発明は明確でない。

<補正等の示唆>

請求項3、及び、請求項7に記載された“ピア部”に係る構成が規定された発明について、新規性・進歩性等を否定する文献は発見していない。

よって、記載不備に係る上記理由IIが解消することで、請求項3、7に係る発明の拒絶の理由はすべて解消する。

なお、Z軸検知用の巨大磁気抵抗素子を突起部に設ける構造は、当該技術分野

において、下記引用文献2等に開示された周知の技術である。また、本願明細書に開示された感磁部とバイアス磁石部とからなる巨大磁気抵抗素子は、下記引用文献1等によって周知となった構成と認められる。よって、これらの構造について更に限定することで上記拒絶の理由を解消することは困難と思われる。補正を検討する際の参考にされたい。

上記の補正等の示唆は法律的效果を生じさせるものではなく、拒絶理由を解消するための一案である。明細書等をどのように補正するかは出願人が決定すべきものである。補正により記載を変更した個所には下線を引き、また、出願当初の明細書のどの箇所を根拠にして補正したかを具体的に意見書で明記されたい。

引用文献等一覧

1. 特開2004-006752号公報
2. 特開平1-250875号公報
3. 特開2004-356338号公報
4. 特開2005-039010号公報

先行技術文献調査の記録

・調査した分野 IPC H01L 43/08

H01L 43/12

・先行技術文献 特開2005-039011号公報

特開2002-299728号公報

この先行技術文献調査結果の記録は、拒絶理由を構成するものではない。

この拒絶理由通知の内容に関するお問い合わせ、または面接のご希望がございましたら下記までご連絡下さい。

特許審査第3部 半導体記憶素子(半導体機器) 三浦 尊裕

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NOTICE OF REASONS FOR REJECTION

Application Number: 2005-077011
Drafted: 2010/12/28 (year/month/day)
Examiner: Takahiro MIURA 3775 4M00
Attorney: Masatake SHIGA et al.
Cited Articles: Article 29, Paragraph 2
Article 36

This application should be rejected for the reason(s) given below. If the applicant wishes to comment thereon, the applicant is invited to submit a response within 60 days from the Mailing Date of this notice.

REASON(S)

I. The invention(s) according to the below-listed claim(s) of the present application could have been easily made prior to the filing of the present application by a person with average knowledge in the field to which the invention(s) belongs based on the invention(s) described in the below-listed distributed publication(s) or made available to the public through electric telecommunication lines in Japan or elsewhere prior to the filing of the present application, and it is therefore deemed to be unpatentable under the provisions of Japanese Patent Law, Article 29, Paragraph 2.

EXAMINER'S COMMENTS

(See the List of Citations for the cited publications)

- Claims 1, 2, 4, and 5
- Citations 1 and 2
- Remarks

In Citation 1, please refer to the entire text and all figures, and in particular, to paragraphs [0034] to [0051] of the second embodiment in the column for the embodiments of the invention, and FIG. 8 and the like.

In Citation 1, a Z-axis magnetoresistive element 24 is disposed on the slope of a wedge-shaped groove 25a, and on this point, the structure differs from that of the invention of the present application, in which a giant magnetoresistive element is disposed on a "slope of a projecting portion".

However, as disclosed in Citation 2, in particular, the column of the embodiments and FIG. 1 and the like, a structure in which a magnetoresistive element is formed on an inclined base that is formed on a substrate by an oxide film such as SiO_2 was well-known technology. Thus, this point of difference is matter that could have been easily conceived by a person having average knowledge in the field.

In addition, setting the peening direction of the magnetosensitive portion to 30 to 60° with respect to the longitudinal direction of the magnetosensitive portion was well-known technology (refer to Citation 2, page 2, lower left column, lines 11 to 13 and the like).

Thus, the invention of the present application could have been easily conceived by a person having average knowledge in the field by applying the well-known structure that has been disclosed in Citation 2 to the disclosure of Citation 1.

- Claim 6
- Citations 1 to 4
- Remarks

Refer to the portions of Citation 1 and Citation 2 explained above. As an etching process in which "linear ridgelines" are formed, a technology in which a heat treatment is carried out on a photoresist film, and then the etched member is etched at an angle after the side surface of the resist film has been made into a slope was well-known technology in this technical field (refer, for example, to Citation 3, paragraphs [0049] to [0051]), and this could have been easily employed by a person having average knowledge in the field.

In addition, a process in which a heat treatment is applied after placing a substrate on a magnet array following the formation of a giant magnetoresistive film, and then forming a giant magnetoresistive element was a well-known process (refer, for example, to Citation 4, paragraphs [0028] to [0033], and FIG. 3 and the like).

Thus, the manufacturing method for a magnetic sensor that has been recited in claim 6 of the present application could have been easily conceived by a person having average knowledge in the field based on Citations 1 to 4 and the like.

II. The recitation of the claims of the present application fails to satisfy the requirements of Japanese Patent Law, Article 36, Paragraph 6, Number 2 with regard to the points listed below.

EXAMINER'S COMMENTS

(Translation was omitted due to irrelevancy with the prior art.)

<Suggestions for Amendments and the like>

No publications have been discovered that contradict the novelty or inventive step or the like of the invention that has been recited in claim 3 and claim 7, in which a structure of a "via portion" is specified.

Thus, the reasons for rejection of the invention according to claims 3 and 7 all can be traversed by traversing reason II, which is due to indefiniteness of disclosure.

Note that a structure in which a giant magnetoresistive element for Z-axis detection is provided on a projecting portion was, in this technical field, well-known technology that has been disclosed in Citation 2 and the like. In addition, the giant magnetoresistive element, which is disclosed in the invention of the present application, comprising a magnetosensitive portion and bias magnet portions is deemed to be the structure that became well-known due to Citation 1 and the like. Thus, traversing the above reason for rejection by further limiting these structures appears to be difficult. Please refer to these comments when drafting amendments.

LIST OF CITATIONS

1. Japanese Unexamined Patent Application, First Publication No. 2004-006752
2. Japanese Unexamined Patent Application, First Publication No. H1-250875
3. Japanese Unexamined Patent Application, First Publication No. 2004-356338
4. Japanese Unexamined Patent Application, First Publication No. 2005-039010

RECORD OF PRIOR ART SEARCH

• Searched Technical Fields: IPC H01L 43/08
H01L 43/12

• Prior Art Reference(s):

Japanese Unexamined Patent Application, First Publication No. 2005-039011
Japanese Unexamined Patent Application, First Publication No. 2002-299728

This record of the prior art search does not constitute the reasons for rejection.